REMARKS

Rejection of Claims and Traversal Thereof

In the September 2, 2009 Office Action:

claims 33-34 were rejected under 35 U.S.C. §102(e) as being anticipated by Balloul et al. (US Patent No. 7,354,591, hereinafter Balloul);

claims 37 and 39 were rejected under 35 U.S.C. §103(a) as being unpatentable over Balloul as applied to claim 34 and in further view of Harris, et al. (International Immunology, 1997, Vol 9, p 273-280); and

claims 27 and 30-32 were rejected under 35 U.S.C. §103(a) as being unpatentable over Balloul as applied to claim 34 and in further view of Chapman et al. (US Patent No. 6,232,099; hereinafter, Chapman).

These rejections are hereby traversed and reconsideration of the patentability of the pending claims is therefore requested in light of the following remarks.

Rejections under 35 U.S.C. §102(e)

Claims 33 -34 were rejected under 35 U.S.C. §102(e) as being anticipated by Balloul. Applicants insist that Balloul is not an anticipatory reference and does not defeat the patentability of the claimed invention.

Applicants' claim 34 recites:

> 34. A genetic construct for expression in a host organism with subsequent administration of the host organism with expressed proteins to a target animal, the construct comprising at least one nucleotide sequence encoding at least one viral coat protein for expression in the host organism wherein the host organism is selected from the group consisting of yeast, bacteria, algae, fish or crustacean and a first and second exogenous sequence, wherein the first exogenous sequence encodes for an antigenic or allergenic protein effective in the target animal and the second exogenous sequence encodes for a tissue-targeting protein, wherein both the antigneic or allergnic protein and tissue-targeting protein, when expressed in

> the host organism, are positioned on the expressed viral coat protein, wherein the expressed tissue-targeting protein has the function of targeting the expressed antigenic or allergenic protein to a specific location on tissue in the target animal after the host organism with the expressed proteins is administered to the target animal and wherein the host organism and target animal are not the same.

Anticipation under 35 U.S.C. § 102 requires the presence in a single reference of each and every element of the claimed invention, **arranged as in the claim**. *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 221 USPQ 481, 485 (Fed. Cir. 1984) (emphasis added)

Applicants insist that the Balloul reference does not in any way disclose, teach or suggest the presently claimed invention. Reviewing claim 34 it is evident that the genetic construct includes a nucleotide sequence encoding a VLP for expression in the host organism along with additional proteins that will be effective in a separate and distinct target animal. Reduced to the basics and in simplistic terms the genetic construct provides for genetic code wherein the VLP is expressed along with tag along proteins in the host organism but the tag along proteins are only effective in the target animal, after the host organism and proteins are administered to the target animal.

The Balloul reference provides for expression of proteins that are only effective in the host organism. Thus, the host organism expresses the protein and then the host organism uses them. Clearly, this is different from the presently claimed invention. Thus, Balloul does not anticipate the present invention as claimed in claim 34 and applicants request that this rejection under section 102 be withdrawn.

Rejections under 35 U.S.C. §103(a)

Claims 37 and 39 were rejected under 35 U.S.C. §103(a) as being unpatentable over Balloul as applied to claim 34 and in further view of Harris. Applicants insist that the proposed combination does not in any way render the presently claimed invention as obvious.

Clearly, the Balloul reference does not in any way disclose, teach or suggest all the claimed elements of the present invention as described above, and the addition of Harris does not rectify the shortcomings of Balloul. Harris, teaches the use of the retrotransposon, Ty, which encodes proteins that are assembled into virus-like particles and carrying the sequences of the der p1 antigen which is known for causing an allergenic immune response. Harris introduces the retrotransposon into a mouse (first recipient) and watches expression therein and for an immune response in the mouse.

Thus, the host organism (first recipient) is affected because the proteins are tailor made for the host organism and certainly not for a separate and distinct target animal. In the present invention, the proteins are tailor made for the target animal and expression is completed in the host organism which is then administered to a target animal (second recipient). Applicants realize that this distinction is very subtle but still provides for patentable subject matter.

There is clearly no discussion, suggestion or guidance in either of the references to go in the direction of applicants' claimed invention. It is also important for the Office to review the "*In re Kubin*" ruling decided on April 3, 2009 because it provides further guidance showing that the presently claimed invention is not obvious. (See I*n re Kubin*, 90 USPQ2d 1417 (Fed. Cir. 2009)) Specifically, the *Kubin* Court revisited the *In re O'Farrell* decision (*In re O'Farrell*, 853 F.2d 894(Fed Cir. 1988)) and discussed that to differentiate between proper and improper applications of "obvious to try," the O'*Farrell* Court outlined two classes of situations where "obvious to try" is erroneously equated with obviousness under §103. In the first class of cases:

> what would have been "obvious to try" would have been to vary all parameters or try each of numerous possible choices until one possibly arrived at a successful result, where the prior art gave either no indication of which parameters were critical or no direction as to which of many possible choices is likely to be successful.

In such circumstances, wherein metaphorical darts at a board filled with combinatorial prior art possibilities, courts should not succumb to hindsight claims of obviousness.

The second class of *O'Farrell's* impermissible "obvious to try" situations occurs where

> what was "obvious to try" was to explore a new technology or general approach that seemed to be a promising field of experimentation, where the prior art gave only general guidance as to the particular form of the claimed invention or how to achieve it.

Clearly, the Ballaoul reference does not provide the necessary guidance to go in the direction of applicants' invention wherein the proteins expressed by the host organism (first recipient) are tailor made for activity in a separate target animal after administration to the target animal (second recipient).

Thus, the proposed combination of Balloul and Harris does not disclose, teach or suggest all the claimed limitations of the presently claimed invention. In light of the above discussion, applicants submit that the Office has not established a *prima facie* case of obviousness, and as such, applicants respectfully request that the rejection under 35 U.S.C. §103(a) be withdrawn.

IV. Claims 27 and 30-32 were rejected under 35 U.S.C. §103(a) as being unpatentable over Balloul as applied to claim 34 and in further view of Chapman et al. (US Patent No. 6,232,099; hereinafter, Chapman). Applicants submit that the cited references either alone or in combination do not render the presently claimed invention as obvious.

As has already been noted, the Balloul reference does not in any way disclose, teach or suggest all the claimed elements of the presently claimed invention and the addition of Chapman, et al. does not provide any additional teachings or suggestions for going in the direction of applicants' claimed invention. Chapman discloses a method of producing a chimeric protein, for example, a biologically active protein such as an antibiotic peptide. Chapman discloses "a method of producing a chimeric protein… wherein the protein derived from the second portion is purified directly from the host cell after expression" (column 3, lines 62-65). In other words, Chapman simply teaches a protein expression system, from which the protein is extracted and purified after expression. Clearly, there is no teaching or discussion in Chapman of using the host organism (first recipient) for delivery into a second recipient wherein any expressed proteins would be effective.

Notably reviewing Figure 1 of the present invention, it is evident that a host organism (yeast) includes the expressed proteins and then this host organism is administered to a target animal which provides for freeing the VLP and with binding of the proteins at receptors in the target animal. Applicants note that yeast carrying the expressed package is very different from the target animal having an intestinal wall.

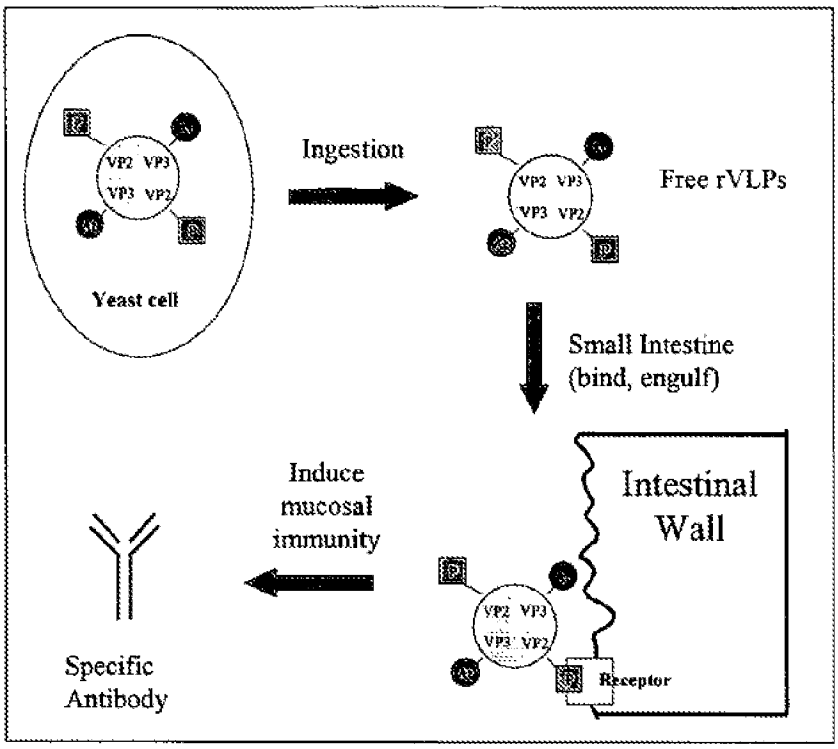

FIGURE 1

There is also the complication that Chapman teaches the use of benign high copy number rod-shaped viruses, such as potato virus (PVX) (a class IV single-stranded RNA virus) within the host cells taught therein and Balloul teaches the use of poxviruses (class I, double-stranded DNA viruses).

The Office does not explain how one of skill in the art would be able to combine the references in order to reach the presently claimed invention. Would the poxvirus of Balloul be transformed into a yeast, plant or bacterial host cell of Chapman? There is absolutely no indication that the large, complex poxviruses taught in Balloul could successfully be transformed into the host cells of Chapman, resulting in functional expression of the recombinant protein for extraction and purification as taught by Chapman. For example, there is no indication that the yeast, plant, or bacterial host cell of Chapman would take up the poxvirus of Balloul; there is no indication that the host cell of Chapman could propagate the poxvirus of Balloul. Further, there is no indication whether, if the poxvirus of Balloul grew and propagated in the host cell of Chapman, the proteins would be expressed; and there is no indication that if the proteins were expressed, they would fold

properly and be functional. Thus, there is uncertainty at every step of a possible combination of the two references.

The Office did not respond or even address this previously raised issue of incompatibility between cited references and to provide a complete response the Office needs to address each argument of applicants.

Applicants remind the Office that Section 2143.01 of the MPEP, as well as the ruling in *In re Ratti*, (270 F.2d 810 (CCPA 1959)) state that where a proposed modification or combination would change the **principle of operation of the prior art invention being modified**, then the teachings are not sufficient to establish a *prima facie* case of obviousness. Thus, a combination of references that fundamentally change the "basic principals" under which the prior art was designed to operate cannot support a finding of obviousness. According to the Board in *Ex Parte Vito Cellini*, (Appeal 2008-4104, BPAI 2008), "a change in the basic principles" refers to change that is fundamental in scope so as to **relates to scientific or technical principles of operation.**

Applicant insists that the suggested combination of Chapman and Balloul will change the "basic scientific principles" of both cited references for the following reasons. Chapman describes the use of a single stranded RNA virus, while Balloul teaches the use of a double stranded DNA virus. One skilled in the art including an undergraduate student taking a simple genetics class knows that RNA viruses and DNA virus operate under completely different scientific principals and involve different steps and possible insertions in a construct to provide expression of the encoded proteins.

As an example, poxviruses, which are ds DNA viruses, have evolved with all the necessary factors for transcription/replication in the cytoplasm and are therefore largely independent of the cellular machinery. However, ss (+) RNA viruses are more complicated for reproduction because the virus coat protein disassembles and releases its RNA genome. The viral RNA serves as mRNA and it is believed that the 5' non-coding region functions as an enhancer of translation. The translated mRNA results in a polyprotein which is processed into mature proteins. Each polyprotein is then cleaved into ten different proteins which are believed to be multifunctional. These proteins, along with host proteins, assemble to form a replication complex. Once the additional RNA copies have been produced, they code for the synthesis of various proteins, as mentioned before, as well as coat proteins.

Clearly, if the teachings of Balloul and Chapman are combined, the **"basic scientific principles" of both cited references will be changed**. As such, the proposed combination does not establish a *prima facie* case of obviousness because the combination of references fundamentally change the "basic principals" under which the prior art was designed to operate.

In light of the above discussion, applicants submit that the Office has failed to put forth a *prima facie* case of obviousness and request that all rejections be withdrawn.

Rejoining of Withdrawn Claims

Applicants request that method claims 42 to 47 be rejoined when the product claims are found allowable.

Petition for Extension and Fees payable

Applicants request a one month extension and filing herewith a Request for Continued Examination. All fees are being paid by electronic transfer. If any additional fee is found due, the Commissioner is hereby authorized to charge any deficiencies, or reimburse any over-charges, to Deposit Account No. 13-4365 of Moore & Van Allen, PLLC.

Conclusion

Applicants have satisfied the requirements for patentability. All pending claims are free of the art and fully comply with the requirements of 35 U.S.C. §112. It therefore is requested that Examiner Blumel reconsider the patentability of the pending in light of the distinguishing remarks herein, and withdraw all rejections, thereby placing the application in condition for allowance. Notice of the same is earnestly solicited. In the event that any issues remain, Examiner Blumel is requested to contact the undersigned attorney at (919) 286-8089 to resolve same.

Respectfully submitted,

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